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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/685,550 | 10/14/2003 | Wayne G. Renken | SENS.005US1 | 4924 |
| 36257 | 7590 | 06/29/2004 | EXAMINER | |
| PARSONS HSUE & DE RUNTZ LLP 655 MONTGOMERY STREET SUITE 1800 SAN FRANCISCO, CA 94111 | | | GARBER, CHARLES D | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2856 | |

DATE MAILED: 06/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/685,550

Applicant(s)

RENKEN, WAYNE G.

Examiner

Charles D. Garber

Art Unit

2856

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) 1-20 and 37-44 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-36 and 45 is/are rejected.
- 7) ☒ Claim(s) 30-32 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 30-32 are objected to because of the following informalities: the claims recite "the transceiver" which lacks antecedent basis in the claims. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 21, 35, 45 are rejected under 35 U.S.C. 102(e) as being anticipated by Akram et al. (US Patent 6,472,242).

Regarding claim 21, Akram discloses methods of semiconductor processing including a substrate 11 shown in figure 1 having a first perimeter, the substrate comprising sensors 30 to measure the processing conditions of the substrate at different areas of the substrate also as shown.

External circuitry 12 may be considered to be an electronics module having a second perimeter as shown at 16. The circuitry is shown connected to the sensors and the circuitry has a data gathering function (column 3 lines 46-55) which is considered equivalent to signal acquisition circuitry coupled to an output of the sensors. The

circuitry may also include communication devices to transmit process conditions which is considered equivalent to data transmission circuitry coupled to the signal acquisition circuitry as in the instant invention. Figure 1 also shows leads connecting the substrate to the circuitry for transmitting signals between the substrate and the circuitry.

Akram does not expressly recite the circuitry including a power source. However, Examiner considers that a source at least of electrical power must be inherent in order to for the electrical device to carry out the functions attributed to it. Whether it is a battery, a power cord connecting to it, or receiver receiving beamed power the perimeter of circuitry 12 will extend to include at least a part of it.

As for claim 35, Akram discloses the alternative of sensing temperature.

As for claim 45, figure 1 shows the circuitry 12 is below the substrate and displaced from the substrate such that the first and second perimeter do not intersect.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 22, 24, 25, 27, 28, 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akram et al. (US Patent 6,472,242) in view of Smesny et al. (US Patent 5,444,637).

Regarding claim 22, Akram as applied to claim 21 above does not expressly teach the signal acquisition circuitry is configured to amplify an output signal of the sensors.

Smesny teaches either a "Bridge amplifiers" or an "inverting amplifier arrangement" is "well suited for producing an output voltage proportional to a resistance value of the sensor (i.e., thermistor or magneto-resistive material)." (column 9 lines 6-13)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an amplifier for the resistance temperature sensors of Akram as they are well suited for producing an output voltage proportional to the sensor resistance.

As for claims 24 and 25, the resistance type temperature sensors of Akram inherently require a power signal in order to function as disclosed.

As for claims 27 and 28, Smesny further teaches The device also includes "signal acquisition/conditioning circuit which receives analog signals from each of the sensors placed upon the wafer and converts the analog signals to corresponding digital signals. Digital signals can then be stored"

It would have been obvious to one having ordinary skill in the art at the time the invention was made to convert analogue signal to digital so that the temperature values may be stored in memory and used to control the processing system.

As for claim 33, Akram does not expressly recite the circuitry 12 comprises one or more connectors to couple a remote system to the device with a communications cable. Smesny however further teaches probe pad 26 which provides mechanical, optical or acoustic access to an external output device.

It would have been obvious to one having ordinary skill in the art at the time the invention was made provide a mechanical access or connector for external output of the processed sensor data in order to provide data on the processing conditions in order to control the processing machinery and optimize the processing conditions (column 1 lines 40-52).

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akram et al. (US Patent 6,472,242) in view of Schwartz et al. (US Patent 5,669,713).

Akram does not expressly teach the data transmission circuitry comprises a microcontroller and is configured to correct the output signal using sensor calibration coefficients.

Schwartz teaches resistance or thermocouple type temperature sensors are calibrated with a calibration device in order to derived calibration value R_{PRTCAL} in a microprocessor 22 used in a process control system (abstract, column 1 lines 13-34, figure 5 and column 7 line 30 to column 8 line 5)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to calibrate a resistance type temperature sensor with calibrations values in a microprocessor. This provides a small device and rapid means of correcting temperature values against an accurate standard.

Claim 26 rejected under 35 U.S.C. 103(a) as being unpatentable over Akram et al. (US Patent 6,472,242) in view of Lauf et al. (US Patent 5,969,639).

Regarding claim 26, Akram as discussed above does not teach a remote data processing system, and wherein the data transmission circuitry comprises a wireless transceiver to transmit the processing conditions to the remote system.

Lauf discloses a similar system with temperature sensor 720 and signal acquisition or conditioning circuit 730. Lauf teaches connecting an RF transmitter 750 and antennae 770 in order to transmit the sensor data to a remote location 850 (see figures 7, 8, abstract, column 1 lines 45-51 and column 3 lines 46-61).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the data transmission circuitry with an RF antennae in order to eliminate hard wire connection outside the process environment which interferes with probe placement or rotating environment.

Claims 29, 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akram et al. (US Patent 6,472,242) as modified by Lauf et al. (US Patent 5,969,639) and applied to claim 26 and further in view of Schwartz et al. (US Patent 5,669,713).

Regarding claim 29, the references do not expressly teach the system comprises configuration to correct the output signal using sensor calibration coefficients.

Schwartz teaches resistance or thermocouple type temperature sensors are calibrated with a calibration device in order to derived calibration value R_{PRTCAL} in a microprocessor 22 used in a process control system (abstract, column 1 lines 13-34, figure 5 and column 7 line 30 to column 8 line 5)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to calibrate a resistance type temperature sensor with calibrations values. This provides means for correcting temperature values against an accurate standard.

As for claim 34, as discussed above with respect to claim 23 Schwartz advantageously taught the system with microprocessor control.

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akram et al. (US Patent 6,472,242) in view of Larson, III et al. (US Patent 6,651,488).

Akram does not expressly teach a transceiver transmits and receives RF signals.

Larson, III discloses a similar monitoring system teaching a transceiver system 28 for obtaining sensor data from substrate processing by interrogation (abstract and figure 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made monitor substrate processing with a transceiver connected to sensors so the data may be obtained by interrogation or on demand. This will have the advantage of saving power on the isolated substrate having limited supply of power by transmitting only intermittently when data are needed rather than continuously.

Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akram et al. (US Patent 6,472,242) as modified by Larson, III et al. (US Patent 6,651,488) and applied to claim 30 and further in view of Lauf et al. (US Patent 5,969,639).

The references as applied to claim 30 teach the in-process monitoring system with a transceiver transmitting and receiving in RF but not expressly in IR.

Lauf discloses a similar system with temperature sensor 720 and signal acquisition or conditioning circuit 730. Lauf also discloses connecting RF wireless communication interface with the conditioning circuit to eliminate wiring. Lauf further explains RF must be interpreted broadly to include, microwave, optical (including infrared) (column 4 lines 18-28 and Example 3).

By Lauf's interpretation of what RF includes Larson, III may be considered to further teaches the use of IR in the broad context of RF which is advantageous for the same reasons given above.

Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akram et al. (US Patent 6,472,242) as modified by Larson, III et al. (US Patent 6,651,488) and applied above and further in view of Smesny et al. (US Patent 5,444,637).

Akram and Larson, III as discussed above with respect to claim 30 teach an in-process monitoring system with a transceiver transmitting and receiving in RF but not expressly with sonic signals.

Smesny discloses a similar in-process monitoring system teaching an output pad 26 providing alternatively mechanical (contact type) as well as optical or acoustic (non-

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contact type) connection to external output device in order to communicate the real time processing conditions so they may be optimally controlled.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide alternatively mechanical, optical or acoustic (sonic) connection to external output device. Having alternative apparatus useful for performing the same function provides for advantageous design choices

Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akram et al. (US Patent 6,472,242) in view of Renken et al. (US Patent 6,190,040).

Akram lacks the connection 14 ribbon cable. Renken teaches ribbon cables 52, 62 in similar application. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make connection with ribbon cable as they have many advantages including extremely small bending radius, high flexibility and minimum waste of space.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Mattoon et al. (US006655835B2) teaches temperature sensor system with remote protective relay attached by cable used for monitoring and controlling motors, generators, transformers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles D. Garber whose telephone number is (571) 272-2194. The examiner can normally be reached on 6:30 a.m. to 3:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

cdg

A handwritten signature in black ink, appearing to be 'CDL' or similar, written in a cursive style.